

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Lattice dynamics at ultra-high pressures using high-resolution inelastic x-ray scattering** DANIEL FARBER, Lawrence Livermore National Laboratory — While our understanding of many physical properties is enhanced by the large body of neutron, the restrictions on sample size imposed by the technique relegated the achievable information to low or at most, moderate pressures ( $\sim 10$  GPa) and to materials readily available in reasonable large quantities. The advent of third generation synchrotron sources and the construction of beamlines dedicated for inelastic x-ray scattering experiments (IXS), these limitations have to a great degree been overcome. Over the past few years our group has focused a large experimental and theoretical effort on quantifying the vibrational energies in metals at high-pressures and high-temperatures. Most recently, we have determined the phonon dispersions across the isostructural gamma- to alpha-cerium transition. Our new data place important thermodynamical and theoretical constraints on the underlying physics of this important transition.

Daniel Farber  
Lawrence Livermore National Laboratory

Date submitted: 03 Jan 2011

Electronic form version 1.4